

COST *and* MANAGEMENT

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The Presentation of Costs to the Executive

By G. A. PHARE

(Before Winnipeg Chapter, December 17, 1928.)

THERE is considerably more to the question of presenting costs to the Executive than the mere physical process of laying them on his desk when he is out at lunch—a more or less general practice in times when costs are not at their best. First of all arises the thought—what cost? And that, necessarily, raises the question—which executive? Because the particular information which the Advertising Manager requires does not interest the Treasurer; and the cost which the Sales Manager considers vital leaves the Foreman of the General Labour gang entirely unimpressed—partly because he has not the slightest idea what it means and partly because he could not use the information if he did.

And yet the Executive who directs a force of salesmen, and the Executive who oversees a gang of coal shovellers, are both equally entitled to ask for, and receive, the information as to those costs controllable by themselves, expressed in a manner which gives them the required knowledge and in a manner readily comprehensible.

This, then, forms the text on which my paper will be built—the necessary information, furnished to the right man, in a readily-grasped form.

This may seem axiomatic, like the arbitrary statements of the late Mr. Euclid, which, as the school-boy remarked, you called axioms because you couldn't prove them if you tried. A very brief reflection will undoubtedly recall more than one group of figures laid aside, either because it presented no feature of interest, or else because it was impossible to make either head or tail of it. The figures, then, were rejected because they violated some one of the requirements of our text. Either the information—compiled, no doubt, at the expense of hours of costly labour—was unnecessary; or else it was not readily understandable.

THE PRESENTATION OF COSTS TO THE EXECUTIVE

To whom, then, shall costs be presented?—and when referring to costs it will be necessary to include those statements which, while not in themselves costs, are really compilations and comparisons of some factor contributing to cost.

Compares Actual With Standard

The Chief Executive, assuming that he exercises an active control, is plainly keenly interested in Costs. Let us suppose that the year's activities have been carefully budgeted ahead of time, and that the firm is one which manufactures for stock. Their various products will have been costed in accordance with the best judgment available at the time. Periodically the Chief Executive will be vitally interested in seeing how actual costs are comparing with the standard working cost built up for budget purposes. In fact, his entire operating policy may be changed periodically by a scrutiny of these two costs. And before making the change he will require yet another cost—an anticipated cost, applying to the period just ahead and under review—a cost based on market trends and conditions, on probabilities rather than on possibilities.

Cost Sheet "A" shows the actual cost-analysis of a previous financial period, compares it with standard, and endeavours to forecast the forthcoming operating period. In this case, the cost accounting has tied in with the general accounting, and therefore the profit per unit shown on the cost sheet, if multiplied by the number of that unit sold, will yield the total net profit credited to the particular line or brand.

Contravening all known laws of nature, from this one parent cost a number of lesser costs will spring. It may be referred to as the Mother cost, because the Cost Accountant can go so far, but no farther. From it will be extracted a factory cost for the Production Manager—a cost of the goods as finished in the factory, from which all Indirect Expenses have been eliminated. That cost, in turn, is split into its component departmental parts, for the information of the foreman responsible. In various guises the cost goes through the Sales Department, the Traffic Department, the Advertising Department, returning with a multitude of queries attached. What would be the effect on cost if the advertising expenditure were doubled in the next period? If Raw Materials advanced 2%, what must be done to main-

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CHART 1.

Cost Sheet A

COST STATEMENT of _____

	AMOUNT per 10 cans	BUDGET			ACTUAL			ESTIMATE		
		Pounds	Pence	Value	Pounds	Pence	Value	Pounds	Pence	Value
MAKING:										
Oil No. 1 _____										
Oil No. 2 _____										
Oil No. 3 _____										
Oil No. 4 _____										
Oil No. 4 _____										
Say Mals. _____										
Producing _____										
Transfers in _____										
Transfers out _____										
Stock Influence _____										
Labor _____										
Expenses _____										
COST OF BASE _____										
Cost of Transfer _____										
Cleaners _____										
Perfume _____										
Color _____										
Labor _____										
Expenses _____										
Stock Influence _____										
COST COMPLETED _____										
Packed _____										
Soap _____										
Wrappers _____										
Inner Box _____										
Outer Box _____										
Labor _____										
Expenses _____										
COST PACKED _____										
Distribution _____										
Selling Expense _____										
COST DELIVERED _____										
Price Recvd. N.A.O. _____										
Margin before Advtg. _____										
Advertising _____										
NET PROFIT _____										
Profit & Loss Chgs. _____										
Cases Sold _____										
List Price (w) _____										
List Price (R) _____										

tain the same margin of profit? Is this margin stable over all territories, and if not, what will it cost to increase sales by 25% in Alberta and decrease by 10% in Saskatchewan. And so on, *an infinitum*.

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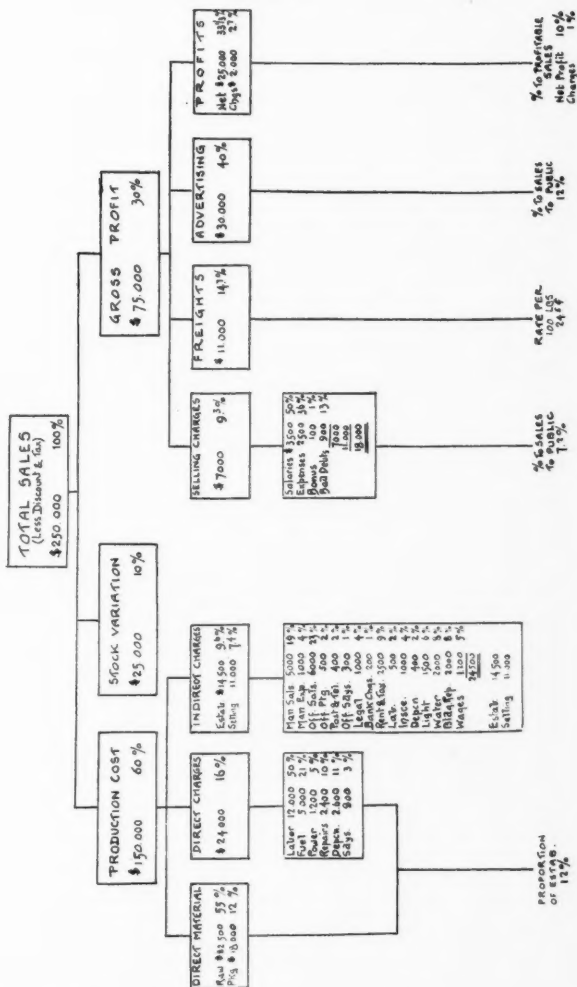
CHART 2

MESSRS. JOHN SMITH & COMPANY LIMITED

LONDON

OPERATING CHART

March Quarter 1928



This particular form of cost statement is the final tabulation of a vast array of figures, and forms one of the most effective management controls available where the type of business permits unit costing for stock, on account of the manner in which it lends itself to forecasting. It is a diag-

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CHART 3

SALES CHART - "B" Territory

Expressed in Dollars

Objective \$15,000.00

1928 _____

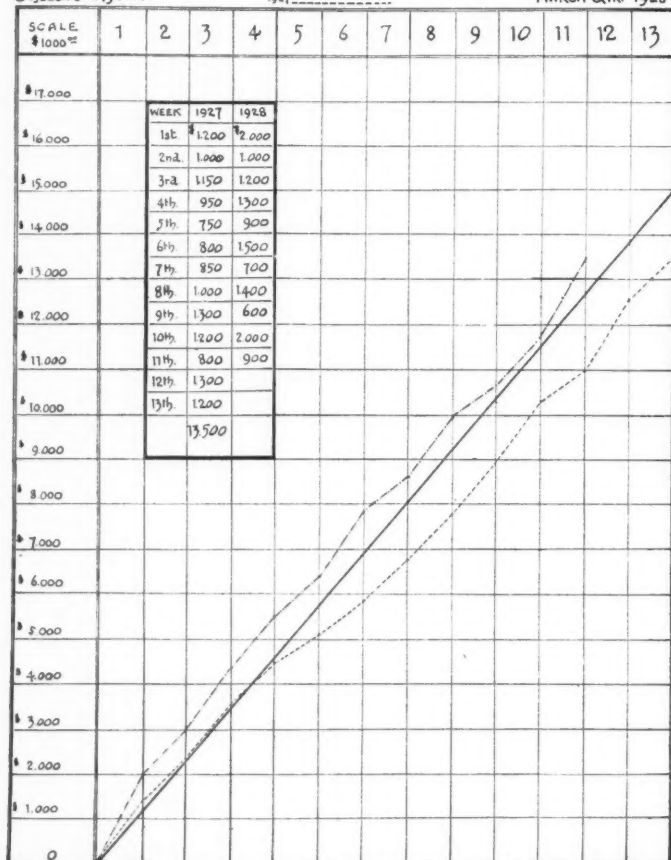
Objective _____

1927 _____

MESSRS. JOHN SMITH & CO. LIMITED

CANADA

MARCH QTR. 1928



nosis only, not a cure for industrial ills. The cure must be supplied by the management after a study of the diagnosis.

Chart 2 is not, properly speaking, a cost at all. Chart 1 contained all the factors used in building up Chart 2,

THE PRESENTATION OF COSTS TO THE EXECUTIVE

CHART 4

FINANCIAL STATEMENT

MESSRS. JOHN SMITH & CO LIMITED
CANADA

AT CLOSE OF BUSINESS 19.....

TO-DAY		CASH SUMMARY		THIS MONTH	
Balance brought fwd.	\$			Balance 1st of Month	
<u>RECEIPTS</u>				<u>RECEIPTS</u>	
From A/c's Rec.	\$			From A/c's Rec.	\$
Sundries	\$			Sundries	\$
Receipts & Balance	\$			Receipts & Balance	\$
<u>DISBURSEMENTS</u>				<u>DISBURSEMENTS</u>	
Raw Materials	\$			Raw Materials	\$
Packing Materials	\$			Packing Materials	\$
Advertising	\$			Advertising	\$
Payroll	\$			Payroll	\$
Expenses	\$			Expenses	\$
TOTAL DISBURSEMENTS	\$			TOTAL DISBURSEMENTS	\$
BALANCE - CASH & BANK	\$			BALANCE - CASH & BANK	\$
<u>ACCOUNTS RECEIVABLE - SALES</u>					
Balance - 1st of Month			\$		
Sales this Month to date			\$		
LESS: Receipts	\$		\$		
Discount Allowed	\$		\$		
Credits	\$		\$		
BALANCE			\$		
<u>ACCOUNTS PAYABLE - PURCHASE CREDITORS</u>					
Balance Brought Fwd.			\$		
Incoming Bills to-day			\$		
Payments to-day			\$		
Discount Earned			\$		
BALANCE DUE CREDITORS			\$		

DETAIL OF BILLS PAYABLE

PAYEE	DUE DATE	RATE	AMOUNT

but shown in their relation to one particular unit. Chart 1 surveys the entire financial field, showing elements contributing to the total cost, and displaying them both as actual totals and in related percentages. Thus, if any

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selected cost factor in Chart 1 appears irregular, Chart 2 will show where that irregularity occurred.

The two charts have their own uses when used separately. Chart 2 gives a general survey of all over efficiency, or the lack of it. Chart 1, as a unit cost, is not 100% accurate, because of the impossibility of measuring with exactness the incidence of many of the burden items. Total Costs alone are not satisfactory, nor are average costs. Hence the attempt to show standard, actual, and estimate on Chart 1. By its use, profitable and unprofitable lines are clearly recognized, and the management can decide where it desires its sales efforts to be concentrated. Chart 2 will be recognized as an adaptation of the burden and expense statement, which authorities agree upon as a necessary statement for executive use.

Subsidiary Statements

A number of subsidiary statements require to come forward periodically to the management, daily, weekly or monthly. The perpetual inventory furnishes frequent stocks on hand of raw materials, while the sales budget provides the information as to the approximate time that these will last, and the combined information enables the purchasing executive to keep ahead of requirements. Weekly and monthly statements of sales provide the necessary information as to whether estimated expectations are being lived up to; and these statements, in turn, receive analysis as to tonnage, value, territorial distribution, and the individual purchases of customers. Chart No. 3, showing actual sales by means of a cumulative curve, compares them with the previous year and with budget expectations. It purports to show a picture only, not a complete survey of the sales results on any given product, and requires to be used as an illustration only to the printed page provided by the reports previously mentioned.

So far the management cost data has dealt with production and administrative angles only. Regardless of the size of the concern the financial aspect requires periodical analysis more frequent than the reading of the balance sheet can provide. Cash in hand and Cash out, after all have their own effect upon cost, and reflect definitely the efficiency of office administration. Chart 4 shows a daily financial statement collated from the various sources immediately

THE PRESENTATION OF COSTS TO THE EXECUTIVE

before the time of closing the office, and made ready for the finance executive on his arrival each morning. From it he receives the exact position of the Bank Account at the close of business last night, shown for that day and cumulatively for the month; Accounts Payable and Accounts Receivable in the same way; Goods Returned; Discounts Allowed and Discounts earned. It has the additional advantage of keeping an office staff up to date in all departments, since no departmental head responsible for providing any of the information placed each day on this form will care to be unable to provide it.

In the text with which we started, three necessary factors were laid down—the right information, to the right man, in the right form. No claim is made, in showing these four charts, that they cover all of the right information; nor that the use of four similar sheets will furnish the Executive with all the information required for the successful administration of a business. They are, so to speak, the high lights only of the four divisions of Manufacture, Administration, Sales and Finance, and must be amplified for the use of the executive directly concerned with those phases of the business.

Forms for Information

So much for the first two factors of our text—the right information, and the right man. A word on the third element—the right form.

The tendency, where a cost system has been installed is towards the accumulation of unnecessary data—interesting from the point of view of the statistician: useless, unless it can be used to make more profit. When the time arrives that every employee from President to Janitor is seized with the idea that they are there solely for the purpose of making profits, and regulate their every action to that end, a business Utopia will have been born.

It is sound practice, then, to provide printed forms for those costs and supporting statements which are in regular use, and to so route the re-ordering of these forms that their presence is brought to the eye of the Office Manager periodically, when he can judge of their usefulness. Otherwise, where a typed sheet is used, information is added and other data are eliminated from time to time, and the value of the sheet is lost for purposes of comparison.

COST AND MANAGEMENT

It is elementary, perhaps, to stress the need for clarity, and yet more clarity, in statements submitted to the executive. He may or may not be burdened with an accountant's mind, he will certainly refuse to be burdened with statements which can be understood only by the employee who compiled them. And yet, time and time again, one encounters the chart filled with multi-coloured and hazy curves—full of vital interest, perhaps, but with the information lost to sight—the old story of not being able to see the forest for the trees. Nor can the importance of the legend supporting any statement of figures be over-emphasized. It is far better to give more information at the head of a series of tabulated figures than to have the executive return them with the query as to whether the figures represent dollars or tons.

Experience indicates that almost invariably the Cost Department assume too much as to the clarity of their statements. The man who compiles a statement is easily led to believe that all of his preliminary mental processes have been transferred to paper—that he has, in fact, charted or recorded all his thoughts on the matter in hand. His accompanying legend becomes inadequate in consequence, and all too often the statement only elicits a managerial enquiry as to what it is all about, accompanied or unaccompanied by a reference to his Satanic Majesty.

The comment is doubtless forthcoming that this stressing of clarity is elementary. It is, however, absolutely essential. Many a cost system has been discarded, much harm has been done to the science of Cost Accounting, through the sad but simple fact that the Executive could not make personal use of the data supplied him for the making of more profit.

In conclusion, then, let us return to our original text, amplified by now with a little explanation—that the presentation of costs to the Executive calls for the preparation, at the earliest possible date, of that information which can be used to the accumulation of profit, put before the Executive most concerned, in the most readily-grasped style.

Cost System of The Norton Company

By A. S. MERRIFIELD

Cost Division, The Norton Company, Worcester, Mass.

(Before Montreal Chapter, February 7, 1929.)

FIRST of all, I want to thank you for the opportunity to tell the Montreal Chapter and its guests of the cost system developed by the Norton Company and which was adopted as a basis for a uniform system by the Grinding Wheel Manufacturers' Association.

To-day's plan is the result of 35 years' constant effort to provide a dependable means for managerial control of its cost problems. Fundamentally it employs the accepted principles of modern Cost Accounting but it likewise has some features which are unique and serve the needs of the industry.

The organization set-up consists of the main wheel manufacturing plant at Worcester, with auxiliary plants for the production of the abrasive material at Bauxite, Arkansas; Niagara Falls, New York; and Chippawa, Ontario. There are distributing warehouses for the finished product in Detroit, Chicago, Pittsburgh, and Philadelphia, and sales offices in several other cities. Branch manufacturing plants are located in Hamilton, Ontario; Paris, France, and Cologne, Germany, but they are all separate companies, and the entire factory system is in all essential features, the same as at Worcester and operated by men trained at Worcester.

First Operation

Let us now journey to Bauxite, Arkansas, the scene of the first manufacturing operation. This place is about 25 miles west of Little Rock and the location of the purest deposit of aluminous clay in the United States. Geologists say that it is the site of an ancient coastal plain.

The present bauxite is decomposed syenite, but the agency bringing about the decomposition is not definitely known. Its principal use is in the manufacture of aluminum.

The accounting set-up is simple.

An inventory account for the bauxite clay, in the condition in which we purchase it. Purchase invoices and all

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handling costs to get it into storage are charged to the account and a cost per ton calculated.

Another account for the material in the condition after passing the entire manufacturing process and an inventory for the Stores' supplies.

There are labor accounts for the principal manufacturing operations and corresponding expense accounts and accounts for taxes, insurance, depreciation and other general overhead expense.

A monthly summary of the payroll distribution is made and a monthly report of disbursements of Bauxite, Clay and Stores' stock is also prepared, specifying the accounts to be charged and forwarded to Worcester, where charges are made to the general ledger accounts.

At the close of the month, the Worcester office closes these accounts into an inventory account, called Calcined Bauxite, which is the finished product as far as this plant is concerned.

Invoices covering purchases of supplies, etc., go directly to the plant and are marked with the account number to be charged and approved as to quantity and quality and then forwarded to Worcester for payment.

The plant is operated continuously, night and day, and the actual production in the month is used as a basis for determining the cost per ton.

There are no in-process inventories to be concerned with. As a control on the cost, the month's tonnage is divided into each of the labour and expense accounts and the results set against predetermined standards and any substantial variances immediately investigated.

Niagara Falls and Chippawa

It is at these plants that the material prepared at Bauxite is converted in electric furnaces to the aluminous abrasive known as Alundum.

The accounting plan is the same as described for the Bauxite plant. There are labour accounts for the principal manufacturing operations and corresponding expense accounts, general overhead accounts, and an inventory account or Stores' supplies and another for the heavy materials and accessories which are necessary in the manufacturing process.

COST SYSTEM OF THE NORTON COMPANY

The latter inventory is supported by subsidiary record for each kind of item in the inventory and the latter record is kept in duplicate, one at the Ore plant and the other at Worcester, and the Ore plant balance sent to Worcester at the end of each month for audit. A physical inventory of this material is taken at the end of each month, and so extreme accuracy is obtained in the charges for what is used.

Materials required at the Ore plants are ordered direct and bills are first sent to them for approval, after which they are forwarded to Worcester for payment and the necessary accounting.

At the end of each accounting period the charges against all Ore plant accounts are closed by the Worcester office into ore inventory account, with the title, Ore.

The manufacturing process at these plants is continuous, but the exact production for the accounting period is known and the tonnage divided into the various labour and expense operation costs and the result set against predetermined standards, and this record serves as a control of the cost of production.

It has been our experience that the monthly results as compared to standards vary more than the cumulative results after several periods have passed, and this is chiefly accounted for by unusual charges in the current period, but at the end of a year there is a remarkably small difference between actual and standard, and, of course, everybody is working to better the standard.

A petty cash fund is maintained at each plant, out of which the payrolls are paid and unimportant purchases of sundry items. This fund is reimbursed each month upon receipt at Worcester of the report of expenditures.

Plant construction work is carried on under definite appropriations from the home office, but all plant costs are calculated at Worcester, and the plant managers are given analyses of the costs for such uses as they may find for them.

It will be noted that these auxiliary plants merely make the reports necessary for payroll distribution, disbursements from Stores and other inventory accounts.

The production of the Ore plants is shipped to Worcester in much the same size as nut coal, and the shipments

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are added to the supply at Worcester at the cost per ton plus transportation and unloading charges.

All calculations relating to taxes, insurance and depreciation are made at the Worcester plant and distributed to the proper operating accounts.

Worcester Plant

We decided many years ago that the factory ledger entries could be prepared by the Cost Department and sent to the Bookkeeping Department for entry. This is the practice followed at present.

We also found it advisable to be very liberal in the number of accounts because of the advantages to be gained in a finer division of charges. Approximately, they number as follows:

Material Used Accounts	50
Productive Labour Accounts	35
Productive Departmental Expense Accounts...	40
General Factory Overhead Account	87
Selling Expense Accounts	250
Adm. Expense Accounts	25
Sales Accounts	25
Inventory Accounts	20

These inventory accounts are perpetual, and wherever practical are physically checked at the end of each accounting period. Many of them, which consist of different items, are supported by auxiliary records for each item. Inventory items contain the cost delivered to the storage locations.

In the case of Stores' supplies, the disbursing price includes the cost of operating the Stores Department, and is spread in the form of a percentage of the total value of the month's disbursements. This rate is our average experience, and over or under distribution is taken care of in subsequent months, so that the balance either way is always small.

All requisitions are for one item only, and a tabulating machine card is used for the purpose and is subsequently punched.

Heavy material, such as coal, clays and other materials used in the manufacture of the product are reported on during the month and the month's totals charged to the proper manufacturing account.

All accounts are closed at the end of the year, but segregated loss and gain statements are prepared monthly for

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each kind of product, of which there are approximately 25.

The cost of operating the service departments, such as machine shop, carpenter shop, drafting room, power and heating, piping and electrical is charged to either asset accounts or the productive departments at the end of each month by the means of a transfer account. To illustrate:

The payroll of the machine shop is charged to Machine Shop Labour, and the expense of operating the machine shop to Machine Shop Expense. An account with the title Machine Shop Transfer is credited each month with the total amount of these two accounts and charges made to the asset or other account that is chargeable.

Departmental expense rates are developed monthly for every department and used in the calculation of the cost of specific items.

We have obtained very satisfactory results with a departmental expense rate, which is the percentage of expense to direct labour. The greater part of our production is at piece rates, which have been set by the rate-setting department, with the view to the earnings of the average man to be approximately the same amount per hour. Furthermore, the type of machinery varies very little within a department and different machines are likely to be used for the same product.

Departmental production is obtained from the manufacturing orders when the operation is finished, and each manufacturing order bears the list price of the piece and the piece finished multiplied by the list price gives the production.

As a means of general control over departmental costs, we make use wherever possible of the list price of our product. Probably you are all familiar with the published price list for grinding wheels.

The ratio of departmental labour to list value and also departmental expense to list value is determined each month. The results are charted and furnished the department heads. Dollar values are shown, as well as curves.

The total of all of the departments is also obtained and presented to the Management in the same way. We have found this means of control of departmental cost very dependable, but obtain additional control through budgets, which will be explained later.

COST AND MANAGEMENT

Costs on specific sizes or special shapes are obtained by the use of piece rates which are paid for the various operations and normal expense rates for items of departmental expense and general factory overhead, material at a known cost per pound and selling and administrative costs which are normal percentages of such expense to the list value of the item.

One of the important manufacturing processes is that of converting the Alundum ore that is received from the Ore plants to the numerous sizes. The ore is automatically weighed before the first crushing operation and after passing the final operation, which consists of screening it to definite sizes, the output is hand weighed and recorded. A loss is incurred in milling the material, the cost of which is absorbed by production.

Inventories are taken at the end of each accounting period of the material in process and its value allowed for in determining the cost of production for the period. The charges made to the In-Process account are for material, labour and departmental expense. Credits are made and charged to an inventory with the title, Finished Abrasives, the latter account being credited with the use and sale.

Inventory control is a problem that is given a great deal of attention. A manual of the procedure has been issued which generally specifies the number of months' supply that experience has shown necessary. The quantity involved depends upon a manufacturing programme, but this is predetermined from time to time and affords the means for calculating quantities.

Many of the materials which we use have to be taken in at certain times in the year to avoid unfavorable weather conditions and for economy in handling the receipts definite quantities per month are specified on purchase orders. In the case of Stores' supplies, minimum and maximum quantities are established. We have been very successful with the arrangements, and the savings in carrying charges have amounted to several times the cost of operating the plan.

A control of expenditures for plant betterments is obtained through definite appropriations from detailed estimates of cost, and a weekly report on each item, beginning at the time 75% of the appropriation has been spent. These reports are sent to the operating executives, and whenever

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there are substantial overruns additional appropriations are requested and passed on by the Management. We have found the scheme of great benefit, especially in the case of experimental work, where there is great probability of over-run.

Further control of costs is being obtained through budgetary control. We have been following a plan for several years which gives promise of economies in every direction. The Business Analysis Department forecasts sales and the factory management decides on a production programme. It is the policy of our Company to build up its stock of finished material during periods of depression, making it unnecessary to hire in any large number of inexperienced help in periods of great activity.

With the two volumes in mind, the budget officer obtains from each department head in every branch of the business an estimate of expenditure for each quarter of the year. The estimates are in considerable detail; the amount of direct labour, the amount of indirect labour which is sub-divided into foremen, clerks, sweepers, truckers, etc., and items of departmental expense, such as maintenance of machinery, buildings, new tools, repairs to tools and important items of supply expense.

These estimates are reviewed by the budget officer, and when out of line with his opinion reasons are obtained for the differences. Finally, the amounts agreed upon for the quarter are listed in a book which is provided for each department. Columns are provided for posting the exact expenditures during each of the succeeding months and also for showing the over or under expenditure for the three months' period. Substantial differences between the budget average per month and the actual expenditure are investigated and a memorandum made in the book of the item.

After each month's entries are made the books are sent to the operating executives for further questioning and then to the departmental foremen. It has been our experience that in allowing the foremen to make their estimates they seem anxious to have the expenditures come close to their estimates and many arguments arise between department heads as to who should bear certain expenses.

A general budget is prepared from all the data that is used in preparation of the departmental budgets, and this is submitted to the Management for its vote of approval.

Advantages of a Thirteen-Period Calendar

By MEREDITH N. STILES,

*Personal Representative of Geo. Eastman, of the Eastman
Kodak Company, chairman of National Committee on
Calendar Simplification for the United States*

(Before Toronto Chapter, February 20, 1929.)

THE public in most countries have come to realize within the past two years, that there is a serious world-wide movement on foot to change the calendar. The question has gotten beyond the stage of academic discussion.

The movement has important and active leadership. Eminent men of business, science, education, journalism and government in different countries are behind it. They are working for an international conference on the subject, to be held, if possible, this year. They hope to put the change into effect in 1933, when January 1 falls on Sunday.

The real impetus came from the International Chamber of Commerce, which in 1922 took affirmative action on the subject. It reached the League of Nations. That body took international action in the matter, calling it to the attention of every nation, and is now prepared to call such a conference as soon as it can be shown that a change in the calendar is generally desired. It is possible that the conference will be called by the United States. Congress has a resolution before it which recommends that the President take this step, or accept an invitation from any other nation or group of nations to participate in such a conference. Hearings have just been held on the resolution before the House Committee on Foreign Affairs.

In any case, such an international conference to change the calendar seems a certainty of the not distant future, for this world is moving inevitably toward the practical, and the practical need for a new time measuring instrument is questioned by few.

It is well recognized, that in these days, the consent of the people is necessary to accomplish any reform in most

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of the civilized world. Julius Cæsar established our present calendar by autocratic decree. There is no autocrat, but the people who can do this now, and to get their approval, education is necessary—call it propaganda, if you like. That is what the leadership of this movement is trying to do—to spread information where it will do the most good on the reasons why the improvement of the calendar will be a blessing to humanity.

Two-Fold Aspect

The question of changing the calendar has a two-fold aspect; the one as it directly affects our personal lives, the other as it affects the organized processes of civilization—business, science, education, agriculture, government. In the latter aspect, of course, it all comes back to us personally, too.

The personal aspect concerns the trouble we have, the time we waste, the mental and physical energy we expend in consulting the calendar and in calculating dates, with which you are all familiar.

The other concerns the serious handicaps which the defects of our present calendar impose upon these processes of modern civilization. Let us take business as the most important example—commerce, industry, finance, transportation. The very fact that this question was first brought to the front by business leaders is a recognition of the fact that for business purposes our calendar is a clumsy contrivance. It is a contrivance which fails to meet the high standard of efficiency which modern business demands of every other instrument it employs in the conduct of its affairs.

It is a device for measuring time that makes inaccurate and deceptive the most important instrument business uses in its affairs — statistical data. Statistics have become fundamental for the control of modern business. In the United States, there is not a major industry which does not maintain an association, bureau or institute for the compilation of trade statistics. The compilation of statistical reports for all industries is now one of the principal functions of most Governments through their ministries or departments of commerce and labour. You are familiar with what the Canadian Government does in this respect. Every indi-

ADVANTAGES OF A THIRTEEN-PERIOD CALENDAR

vidual business controls its operations on the basis of statistics of its past performance. These statistics are based on our calendar and preponderantly on the month as the unit of time.

Thus the calendar is the real basis of our business life. Did we gain last month or did we lose? How did last month's business compare with that of the same month a year ago? How did the figures on steel, coal, copper production, car loadings and railway revenues compare last month with those of other months? We examine the statistics. "Figures don't lie," we say, but when that axiom is applied to statistics, based on the calendar, it deceives us. They do not give a truthful picture of the facts.

The Month and the Week

This is because of the capricious arrangement of two of its units, the month and the week. The months are of unequal length and the weeks will not fit into them an equal number of times. There are always two or three days in each month which belong to a week of another month. Sometimes in addition to four complete weeks there may be parts of two other weeks. For example, December of last year began on the last day of one week and ended the second day of a sixth week.

Moreover, the individual days of the week shift every year to different dates of the month. In different months, some of them occur five times, while the rest occur only four times. These three defects of the calendar, the unequal months, the fractional parts of weeks they contain, and the shifting of the dates of week days, cause unnecessary inconvenience, difficulty and confusion to men and women in every walk of life, but especially to the accountant and statistician. As the month may contain 28, 29, 30 or 31 days, all calculations of salaries, interest, insurance, pension, rent, etc., fixed on a monthly basis are inaccurate because they do not correspond with $1/12$ of the year. There is a difference of 11% between the number of days in March and the number of days in February. There may be a difference of 19% between the number of working days in March and the number of working days in February depending upon how the calendar shifts the days of the week to different dates of the months from year to year. In the field of

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industrial statistics and business accounting when you attempt to give a picture of progress by figures showing the volume of business in a month which has twenty-seven working days compared with a month that has only twenty-four the picture is not true, unless adjustments are made to justify the difference in the different number of days. You are being misled when you use these statistics to judge of past performance or to estimate the future. Sometimes you may have five pay days in one month, in fact, where concerns pay by the week, there are four months in every year which have five payroll closings and when you come to compare these months with the months which only have four payroll closings, your monthly production, cost and burden reports are bound to be out of line unless adjustments are made.

How Intricacies Arose

This arrangement is altogether an irrational one. It is a device of the ancients, now nearly 2,000 years old. Other systems, methods or instruments of past generations have either been scrapped or changed for something better. Those of this generation are constantly being scrapped or changed for something better. But the structure of our calendar has been left untouched.

How did our calendar "get this way?" Its history is interesting as showing that its hodge-podge arrangement is largely a product of vanity and superstition. The story goes back to the Egyptians. They were the first people in history to determine the true length of the year. They developed a calendar consisting of twelve equal months of thirty days each with five final festival holidays. This knowledge was extremely valuable to them in determining the proper time to plant their crops. It was the first scientific calendar.

Centuries went by and the Romans conquered Egypt. At that time the Romans were using a lunar calendar consisting of twelve months of twenty-nine and thirty days each alternating. It fell short by eleven days of measuring the true length of the year with the consequence that the calendar was continually falling behind. Sometimes it was necessary to insert a month or two to adjust it to the seasons. At the time Julius Cæsar became Cæsar, the Roman calendar was three months behind the year. He summoned an Egyptian astronomer named Sosigenes to tell him about the Egyptian calendar. Together they constructed a new calen-

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dar for the Roman Empire based on the Egyptian. Cæsar did not like the five festival holidays. He distributed these days, not as holidays, but as regular days, among the twelve months, making the months an odd and even number of days in length. He liked that idea, too, because of the superstition that odd numbers were lucky. He had July, his birth month, with thirty-one days named for himself. February had twenty-nine and the rest thirty or thirty-one days each.

Cæsar was assassinated and along came Augustus Cæsar. Augustus thought he would like to have a month named for himself also, and picked August his birth-month. As it only had thirty days, he took one day off of February, leaving twenty eight in February, and tacked it onto August, making thirty-one. As this made ninety days in the first quarter of the year and ninety-three in the third, the Roman landlords objected to this and complained to Augustus. Augustus said: "All right, I'll fix that," so he took a day off September and tacked it onto October. He took a day off November and tacked it onto December.

This is the capricious arrangement of the months of the calendar which after two thousand years we still use, a monument to the vanity and superstition of two autocrats.

About 350 A.D. Constantine the Great decided that the Christian observance of a seventh day of rest was a good thing for the Roman Empire, so he established the seven-day week. But Christendom's seven-day week did not fit into the pagan months of thirty and thirty-one days. It did not make so much difference in those early times when economic life was simple, but in this modern age when life is complex, when the element of time is vastly more important in the conduct of affairs, these faults of the calendar—that the weeks will not fit an even number of times into the months, and that the months are unequal—have become real hindrances.

Pope Gregory in 1582 wisely corrected the calendar for an error which Cæsar and Sosigenes had made in calculating Leap year. He dropped out ten days, but he made no change in the arrangement of the weeks and months.

The need for revising the calendar has been fully realized in modern times, but custom and tradition have stood in the way of getting action.

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The Present Movement

In 1922, however, the International Chamber of Commerce, took the matter up, with the result that the International Chamber requested the League of Nations to consider the question of revising the calendar. The League appointed a Committee of Enquiry to study the subject. It investigated the question for three years, examining nearly two hundred plans of calendar change submitted to it from all parts of the the world. The Committee finally reduced these plans to two projects which it recommended as the most practical, but before undertaking the step of calling an international conference decided that it would be wise to ascertain if the public sentiment throughout the world was in favour of scrapping the present calendar for a new one. The League accordingly invited all governments to submit information in respect to public sentiment in their respective countries and suggested the organization of national committees to explain the question and ascertain public opinion on the subject. This invitation was sent in September, 1927.

In the meantime, Mr. George Eastman, Chairman of the Eastman Kodak Company, had been active in promoting the International Fixed Calendar devised by Moses B. Cotsworth, an English-born Canadian Statistician and scientist, whose home is in Vancouver. This plan of calendar revision had attracted Mr. Eastman's attention and appealed to his business sense as the most practical plan of calendar revision of the many that had been proposed. Mr. Eastman supported Mr. Cotsworth in his effort to interest the public in the plan, and himself sent out a questionnaire among a thousand business men of the United States requesting their opinion on it. He received six hundred replies of which ninety-three per cent. were favourable.

When the United States Government received the invitation from the League of Nations, there was a meeting between Secretary of State Kellogg and Mr. Eastman, which resulted in the organization of the National Committee on Calendar Simplification for the United States with the sanction of Mr. Kellogg. Mr. Eastman became Chairman of the Committee, which is now engaged in fulfilling its mission, that of ascertaining what the public opinion of the United States is on the question of adopting a new calendar. Its membership, including special committees, rep-

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resents nearly a hundred men and women who have pledged their support to the inquiry. Letters have gone out to thousands of organized bodies in these different divisions of national activity. These letters ask two specific questions:

Do you favour simplification of the calendar?

If so, which of the two principles of calendar revision do you favour? One which divides the year into equal quarters with months of thirty, thirty and thirty-one days each, or one which divides the year into thirteen equal months of twenty-eight days each?

The two projects mentioned in this questionnaire are the two recommended as the most practical by the Special Committee of Enquiry of the League of Nations. Whereas the first one is more favoured in some European countries, the thirteen-month plan, which is the International Fixed Calendar of Moses B. Cotsworth, has been favoured by the majority of the opinion that has so far been collected in this country. In fact, the returns that we have received from our letters up to date are nearly unanimous in favour of the thirteen-month plan.

The Thirteen-Month Plan

The thirteen-month plan appeals to practical business men, because it remedies the faults of the present calendar in thorough-going fashion, whereas the equal-quarter plan is only a partial remedy. The former provides for thirteen equal months of twenty-eight days each. A new month would be inserted between June and July, which has been given the tentative name of Sol, which is the Latin name for sun and would serve in all languages. Fixity is attained by regarding the 365th day of the year, which is the one odd day over fifty-two weeks, as a blank day to be observed as an extra Sabbath. Leap Day, one in four years, would be placed at the end of June, and likewise would be regarded as a blank day. Neither day would count as a part of the week.

If this plan is adopted:

All months will be equal and exactly comparable.

Every month would contain four complete weeks and the split week would be eliminated.

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Every week day would fall upon the same fixed dates every month. Saturdays, for example, would always fall on the 7, 14, 21 and 28.

Holidays would always fall on the same days every year.

There would always be the same number of work and production days in every month.

There would be no more five-week payrolls. All periods of earning and spending would be exactly equal to or exact multiples of one another.

Business conducted with such a rational calendar as this would always be able to gauge accurately what it has done in the past and what it may do in the future. It has been unanimously endorsed by the National Association of Cost Accountants of the United States.

Here in Canada, we understand that no action has as yet been officially taken toward the formation of a national committee, but it is gratifying to note a statement in the "Interdependence," published by the League of Nations Society in Canada, "that the Ottawa Branch of that Society has urged its Central Executive to approach the Government on the matter."

Already in Use

Already the thirteen-month plan is in use in several countries. More than a hundred manufacturing concerns in the United States are using private thirteen-period calendars of their own for their interior operations and the number of these users is rapidly growing. Several of the British Railways are using this plan. The Mercury Mills, Ltd., of Hamilton, Ontario, is a Canadian concern which is using it. Some of those in the United States are: Cellucotton Products Co., Neenah, Wis.; Chemical Paper Mfg. Co., Holyoke, Mass.; Fuller Brush Co., Hartford, Conn.; Graton & Knight Mfg. Co., Worcester, Mass.; The Hearst Publications, Inc.; International Textbook Co., Scranton, Pa.; Western Clock Co., LaSalle, Ill.; C. G. Conn, Ltd., Elkhart, Ind.; Eastman Kodak Co., Rochester, N.Y.; Fiberloid Corp., Indian Orchard, Mass.; Sauquoit Silk Mfg. Co., Philadelphia, Pa.; Scott Paper Co., Chester, Pa.; Simonds Saw & Steel Co., Fitchburg, Mass.

Many of the advantages of the International Fixed Calendar can be secured by a company using the thirteen-period calendar, but obviously all the advantages cannot be

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obtained because for many operations the twelve-month calendar will still be necessary. It is still necessary to follow the regular calendar in mailing invoices to customers at the end of the month and in handling payments of accounts payable. Nevertheless, these companies have found that the advantages to be derived from a thirteen-period calendar far outweigh the inconvenience experienced in having to use two calendars. Extracts from letters from some of these companies are:—

The Graton & Knight Mfg. Company: "We have been conducting our accounting on four-week periods since January 1, 1918. This gives us thirteen periods of four weeks each per year, with the exception of either the fifth or sixth year, when we have to have the thirteenth period made up of five weeks. We have found this system to be very helpful in payroll distribution and comparison of all financial, sales and manufacturing statistics. We are still obliged to render our customers' statements from the accounts receivable ledgers at the end of each calendar month. There is an additional cost in compiling thirteen financial records, statistics, etc., in a year instead of twelve, but this is more than compensated for by the increased value of statistics by being able to compare them easily and intelligently."

The Fuller Brush Company: "We have found, over a period of years, that it was very hard from a standpoint of consistent sales promotion, to use the regular twelve calendar months, with the result that, beginning January 1, 1925, as a Company, we went on a thirteen-month calendar, calling them periods of four equal weeks. We have found this program in the past two and a half years to be very satisfactory in equalizing our sales reports and sales promotion work, and in the proper accounting and statistical recording of our business."

C. G. Conn, Ltd.: "A large number of business concerns have recognized the impracticability of making their reports on a monthly basis according to the present calendar and have substituted therefor four-week periods. This company has operated on this basis for eight or ten years and finds that there are many advantages in using the thirteen-period year over the twelve-month calendar year."

The Eastman Kodak Company adopted the thirteen-period calendar for all factory records and accounts beginning January 1, 1928. The chief benefit obtained is that all

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periods are comparable without any adjustment being made for the unequal number of days and the unequal number of weeks. No adjustment is necessary in the factory cost, burden and production reports; the splitting of payrolls is unnecessary; the burden reports are comparable for different periods of the same and for corresponding periods of different years without any adjustment. Some difficulty was had in comparisons between the periods of 1928 and the months of 1927, but where accurate comparisons are necessary, the 1927 figures are converted to the 1928 basis. Of course there is a slight additional expense involved in making thirteen statements a year instead of twelve, but the saving due to the elimination of adjustments outweighs this item.

Thirteen-Period Calendar

Under this plan the year is divided into thirteen periods of four weeks each, each period consisting of twenty-eight days. Except for holidays, the periods are of the same length, and are, therefore, comparable without adjustment. Thirteen months of twenty-eight days account for 364 days, leaving one day over in ordinary years and two days over in leap years. Thirteen is not divisible by four, hence thirteen periods cannot be grouped into quarters having an even number of whole periods. Many concerns, nevertheless, have used this calendar for over thirty years.

Survey of Forty-eight Concerns Using the Thirteen-Period Calendar

In order to find out the experience of these concerns with this calendar, the advantages and disadvantages which they found, and the methods which they used in overcoming obstacles, a questionnaire was sent to a list of over sixty concerns using this calendar by the American Management Association. Replies were received from forty-eight concerns.

Method of Handling the Extra Day

Each ordinary year has one extra day beyond thirteen months of twenty-eight days and leap year has two extra days. There are two methods of taking care of these extra days. The first method, which is used by the majority of firms, is the plan of letting these days accumulate and inserting an extra week in the thirteenth period every five or six

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years. This means that in the fifth or sixth year the thirteenth period will not be comparable with the other periods, and allowance will have to be made for this in comparative statements. This method has an advantage in that the period would always begin with the same day of the week and always end with the same day of the week. Upon inauguration of the calendar a concern can select any day it chooses for beginning the period.

The other method is to include the extra days, or two extra days in leap year, in the last period, so that the thirteenth period of this year for instance, if the first period began on January 1, 1928, would end with the regular calendar month, December 31, 1928. The 1929 work calendar would then begin the same as the regular calendar, on January 1. This method has the advantage of starting the work calendar on the same date as the regular calendar. The thirteenth period would not be exactly comparable with the other periods under this method, but there would be a difference of only 1.28 in ordinary years and 1.14 in leap years, which should not upset comparisons very much. It has another disadvantage in that corresponding periods of different years begin on different days of the week.

Of thirty-eight companies replying to this question, twenty-two use the method of accumulating the extra day for five or six years, then adding the extra week, and sixteen use the method of including the extra day in the first or last period of each year.

Method of Handling Quarterly Closings and Reports

In the thirteen-period calendar the quarter consists of three periods plus one week, the half year consists of six periods plus two weeks, and three-quarters consists of nine periods and three weeks. This is one of the chief objections which has been raised against the use of a thirteen-period calendar. Over half of the companies who replied to this question stated that they had done away with quarterly closings and reports entirely, finding them unnecessary. The general practice among these concerns is to issue cumulative reports by periods, having a report, say, of the second period, the third period, the first four periods, etc., getting comparisons with the corresponding periods of different years. If it is necessary to compare the first three periods with the second three periods, this can easily be done,

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whether this length of time exactly corresponds with the quarters under the regular calendar or not.

The other practice is to have three-quarters of three periods each and one quarter of four periods. The nature of the business determines in which quarter of the year the extra period will be included. Most of the companies reporting use the first three quarters of three periods each and the last quarter of four periods. In other companies the second or third and in one company the first quarter has the extra period. In a seasonal business it often happens that the sales in four periods during the slack time of the year would not exceed the sales in three periods during the busy part of the year. In such a business there is then practically no disadvantage in having the extra period included in one of the quarters.

Four of the concerns reporting close their books according to the quarters under the regular calendar. This practice, of course, involves an extra closing and an additional report, but in some cases the quarterly reports may be issued in place of monthly reports.

There is a tendency, however, for concerns using this type of calendar to do away with quarterly reports entirely, and many of these who are using the second method indicate that the number of quarterly reports has been considerably reduced, as they were found to be unnecessary.

Extent of Use Within the Individual Concern

1. Accounts Receivable and Statements to the Trade: Most of the companies send their statements to the trade according to the regular calendar. Some companies stated that they tried sending statements by periods, but it was confusing to the trade, who were using the regular calendar, and consequently they have gone back to the regular calendar. Two concerns have been able to send their statements out according to the periods without causing any difficulty to the trade.

Some concerns stated that, while they were sending their statements out to the trade according to the regular calendar, they closed their accounts receivable ledgers according to the period basis. Their accounts were cumulative and statements would be taken off at the end of the regular calendar month.

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2. Handling Accounts Payable: Of thirty-nine companies who replied definitely to this question, ten use the periods in paying accounts payable, and twenty-nine pay according to the regular calendar month. The larger proportion using the regular calendar is accounted for by the difficulty of getting concerns from whom the materials, supplies and services are bought to render statements according to the periods used by the individual concern. The ten concerns who are paying their bills according to the thirteen-period calendar have in many cases made arrangements with their vendors to send statements according to their period dates. Several of them have made arrangements with their banks, supplying the banks with the closing dates of their periods, and statements are rendered on these dates and not at the end of the month.

3. International Records and Accounts for Both Office and Factory: In answer to the question, "Do you use the calendar for all internal records, statements and accounts for both office and factory?" thirty-four out of a total of forty-three answered "Yes." The others said they did with a few exceptions. In some cases the general books were excluded, in some the customer's accounts receivable were closed according to the regular calendar, some companies use it for cost accounting only, and other companies are using it only in their factory and not for the executive offices.

From the replies received on this question, it seems to be the general practice to use the thirteen-period calendar for all the internal records, including the general books. Of course, if all the advantages are to be obtained, the application should be universal within the company. Those companies who use it in the factory only will undoubtedly encounter difficulty and confusion from the use of the two systems, because they will have some statements on the thirteen-period basis and some on the regular calendar basis. If the plan is advantageous for the factory, there seems to be little reason why it would not also be advantageous for compiling sales records and the many other records necessary for the administrative end of the business.

Payment of Salaried Employees

Most of the concerns reporting pay the salaried employees thirteen times a year. There seems to have been little difficulty experienced in putting these employees on

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the thirteen-period basis, and in many cases the employees were glad to have their pay thirteen times a year instead of twelve. It simplifies the costs, of course, if the salaried employees are on the same basis as the other costs.

POSITIONS AVAILABLE

(Address No. The Canadian Society of Cost Accountants, 81 Victoria St., Toronto.)

Number 109—Large Company has an opening for a recently qualified Chartered Accountant desirous of entering the commercial field. Applications will be held in strict confidence.

Number 110—Cost Accountant wanted for rubber plant in Western Ontario. Age 30 to 35 years, with experience preferably in the rubber industry. Salary about \$200 per month.

THE TREND OF PRODUCTION COSTS

The most important change in recent weeks, affecting production costs, has been the advance in money rates, which means higher charges on temporary loans or on funded debt, with consequent increase in overhead costs.

Business has been so active that employment is plentiful, amounting in some lines to nearly a scarcity of labour. Consequently there is no sign of lower labour costs, and most of the changes are in the other direction. Labour difficulties are few, however. In the month of March there were only eleven strikes or lockouts in Canada. Four of these had been carried over from February, and by the end of March there were only three left, as follows: Plumbers in Kingston, shipwrights at Vancouver, and musicians at Ottawa.

Commodity prices showed a slight advance in March, the Dominion Bureau of Statistics index number, which is based on 502 commodities with 1926 taken as 100, advanced from 95.7 at the end of February to 96.1 at the end of March. In April, however, it declined to 94.1. Some of the important decreases in April were in grains, raw cotton, base metal, coal and gasoline.

